SUPREME COURT, U. S.

Supreme Court, U. S.
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IN THE

Supreme Court of the United States

OCTOBER TERM, 1974

NO. 74-1038

LAYNE-NEW YORK COMPANY, INC., Petitioner,
v.
ALLIED ASPHALT COMPANY, INC.,
B. H. MOTT & SONS, INC., and COMMONWEALTH
OF PENNSYLVANIA, Respondents.

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE THIRD CIRCUIT

JOHN M. WEBB
515 Oliver Building
Pittsburgh, Pennsylvania 15222
Counsel for Petitioner

WILLIAM H. LOGSDON and
WEBB, BURDEN, ROBINSON & WEBB, P.A.
515 Oliver Building
Pittsburgh, Pennsylvania 15222
Of Counsel

SMITH BROS., LAW PRINTERS, 620 SECOND AVENUE, PITTSBURGH, PA. 15219

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IN THE

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NO. .....

LAYNE-NEW YORK COMPANY, INC., Petitioner,

v.

ALLIED ASPHALT COMPANY, INC., B. H. MOTT & SONS, INC., and COMMONWEALTH OF PENNSYLVANIA, Respondents.

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE THIRD CIRCUIT

To The Honorable Chief Justice and the Associate Justices of the Supreme Court of the United States:

Petitioner, Layne-New York Company, Inc., respectfully prays that a writ of certiorari issue to review the judgment of the United States Court of Appeals for the Third Circuit entered August 5, 1974.

THE OPINIONS BELOW.

The opinion of the Court of Appeals for the Third Circuit is reported at 501 F. 2d 405 and is appended hereto as Appendix A. The judgment entered thereon is appended hereto as Appendix B.

The opinion and order of the District Court on motions for judgment n.o.v. filed by all parties is reported at 363 F. Supp. 299 and a copy thereof is appended hereto as Appendix C. The special verdict of the jury and judgment of the District Court thereon are

appended to the District Court's opinion as Appendices I and II, respectively. The amended order of the District Court is appended hereto as Appendix D. The order of appealability of the District Court is appended hereto as Appendix E and the order of the Court of Appeals allowing appeal is appended hereto as Appendix F.

JURISDICTION.

The judgment of the Court of Appeals was entered August 5, 1974. A timely petition for rehearing was filed by petitioner August 19, 1974. The petition for rehearing was denied November 22, 1974.

The jurisdiction of this Court is invoked under 28 U.S.C. Section 1254(1). Jurisdiction in the District Court is based upon 28 U.S.C. Section 1338(a) and in the Court of Appeals upon 28 U.S.C. Section 1292(b).

QUESTIONS PRESENTED.

1. Did the Court of Appeals deprive petitioner of its Seventh Amendment right to trial by jury by substituting its opinion on obviousness of a patented invention for the jury verdict of nonobviousness without finding that there was no substantial evidence to support the jury verdict?

Implicit in this question is an important and recurring question on the scope of appellate review in patent cases, namely:

2. Is the "non-obvious" condition for patentable subject matter of 35 U.S.C. Section 103 a question of fact or a question of law?

3. Did the Court of Appeals deprive petitioner of its property (a patent) without due process of law in violation of the Fifth Amendment in holding the patent invalid for obviousness, reversing the verdict of a jury and the fact findings of the District Court on motions for judgment n.o.v. without finding or holding (1) that there was no substantial evidence to support the jury verdict and (2) that the findings of the District Court were clearly erroneous?

CONSTITUTIONAL PROVISIONS AND STATUTES INVOLVED.

The questions presented involve Article I, Section 8, of the Constitution, which provides that the Congress shall have the power

> "To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."

They also involve Amendments V and VII to the Constitution which provide, in pertinent part:

Amendment V:

> "No person shall be . . . deprived of life, liberty or property, without due process of law. . . ."

Amendment VII:

> "In Suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury, shall be preserved, and no fact tried by a jury shall be otherwise reexamined in any Court of the United States, than according to the rules of the common law."

The statutes involved are part of the Patent Code of 1952, Title 35 U.S.C. They are, in pertinent part:

Section 101:

> "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title."

Section 103:

> "A patent may not be obtained though the invention is not identically disclosed or described as

set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made."

Section 261:

"Subject to the provisions of this title, patents shall have the attributes of personal property. . . ."

STATEMENT OF THE CASE.

Petitioner, Layne-New York Company, Inc., is assignee of Reinhold United States Patent No. 3,469,405 which relates to two of our most pressing national concerns, the protection of the environment and the production of energy. The Reinhold patent discloses and claims a method of constructing mine water barriers in active and abandoned coal mines which will prevent acid mine water contaminated by the mine workings from flowing out of the mines and into water sources such as streams, rivers and lakes.

The shortage of oil and gas has brought about the reevaluation of coal as a principal energy source resulting in renewed mining activities in closed coal mines and opening of new mines. To work these mines without damaging the environment it is essential that contamination due to the drainage of acid mine water be controlled.

Even at present, the environmental problem caused by the drainage of acid mine water from abandoned

mines is tremendous. The magnitude of the environmental problems in Pennsylvania alone is demonstrated by the fact that in 1965, $500,000 was earmarked by the Pennsylvania legislature to attack the problem. Later, in the spring of 1967, the people of the Commonwealth of Pennsylvania authorized a $500,000,000 land and conservation bond issue of which $150,000,000 was to be devoted to the acid mine drainage problem.

Acid mine water has been a problem for many years. Many techniques have been tried over the years to effectively control it, including the construction of expensive water treatment plants and the construction of concrete seals within the mines; however, prior to the Reinhold method none had been completely successful.

In 1967, the Commonwealth of Pennsylvania was developing a new park which was expected to cover 15,990 acres of land and include a 3,225 acre man-made lake. The park area would offer facilities for boating, swimming, fishing, picnicking, ice skating, together with areas for skiing, camping and nature studies. This project depended upon prevention of the acid mine water problem.

Therefore, in May 1967, the Commonwealth engaged Gwin Engineers as consultants to "make an engineering report with specific recommendations based on their examination for the abatement, alleviation and/or treatment of the mine drainage in the park watershed area."

By December 1967, Gwin Engineers had concluded that a concrete seal should be used to close the deep mines in the park. All the previous approaches for installing concrete seals had been considered but Gwin was not satisfied with the prior art methods. Hence in January 1968, Gwin Engineers, through Mr. John Foreman,

presented the problem to Mr. Reinhold of Layne-New York. In response to this request for help Mr. Reinhold studied the problem and conceived the solution which ultimately was embodied in Reinhold patent No. 3,469,405.

At the outset Gwin was somewhat skeptical of the Reinhold method and the Commonwealth was obviously hostile. Therefore, in the summer of 1968, Layne-New York and Gwin built a barrier using the Reinhold method to test the feasibility and operability of that method. The test barrier constructed by following the steps set forth in Claim 1 of the patent in suit was very successful. Thereafter, Mr. Foreman promptly prepared specifications for the construction of mine water barriers according to the Reinhold method to prevent water pollution in the new park.

The Commonwealth accepted the specifications embodying the Reinhold method for construction of mine water barriers to protect the new park. Eventually contracts were let and mine water barriers installed by respondents, B. H. Mott & Sons, Inc. and Allied Asphalt Company, Inc., using the Reinhold method.

On August 14, 1970, petitioner filed two suits charging Allied and Mott with infringement of the Reinhold patent because of the work under those contracts. Fifteen months later the Commonwealth of Pennsylvania moved to intervene as party defendant in both actions and was permitted to do so because of the "public interest" involved in the cases. The cases were subsequently consolidated for trial by a jury (demanded by respondents) limited to the issues of validity and enforceability of the patent. Infringement and other issues were reserved for further proceedings.

After a trial lasting eight days, the jury returned a special verdict (App. 38a-39a) finding Claim 1 of the patent valid, but also finding that Mr. Foreman was a joint inventor with Mr. Reinhold. Judgment was entered for respondents on this verdict since petitioner did not possess full title to the patent and, hence, lacked capacity to maintain the actions (App. 40a-41a). All parties filed motions for judgment n.o.v. The District Court in a detailed opinion granted petitioner's motion holding that there was "no substantial evidence supporting the jury's finding that John W. Foreman was a co-inventor" (App. 31a). The District Court denied respondents' motions. With regard to the validity of Claim 1 of the patent the District Court carefully reviewed the evidence and the jury verdict under the relevant legal criteria established by this Court and concluded (App. 16a):

> "The court here unequivocally states, however, that its view of the evidence in this case is the same as that of the jury with respect to patentability; that under the standards and rules applicable to patents the method described in this patent constitutes a valid invention; that there was novelty in this invention; that there was no anticipated prior use; and that none of the other exceptions described in 35 U.S.C. 102 and 103, were operating in this case."

Pursuant to this ruling the District Court entered an order restoring the cases to the trial list for purposes of determining the issues of infringement and damages (App. 36a-37a). Respondents promptly moved for an order that the cases involved controlling questions of law entitled to immediate appeal, which was granted by the District Court (App. 43a-44a). The Court of Appeals similarly granted respondents' motion for immediate

appeal pursuant to 28 U.S.C. Section 1292(b) and the cases were again consolidated for hearing in the Court of Appeals.

In an opinion filed August 5, 1974, the Court of Appeals reversed the District Court's judgment on the ground that the patented process was reasonably obvious to one with ordinary skill in the art at the time of the invention. The Court of Appeals did not find that there was no substantial evidence to support the jury verdict. It did not refer to the findings of the District Court or hold that they were clearly erroneous. And, although it referred to and quoted from *Graham v. John Deere Co.,* (1966) 383 U.S. 1, it did not make the factual inquiry mandated by this Court. It merely substituted its opinion on obviousness for that of the jury and the District Court.

REASONS FOR GRANTING THE WRIT.

This petition raises substantial, important and recurring questions relating to the scope of appellate review in patent cases on which this Court has not expressly passed and on which there is a clear conflict between the Courts of Appeals for the Third, Fifth and Ninth Circuits, on the one hand, and the Fourth and the Tenth, on the other.

In addition, the petition presents significant constitutional issues. The Court of Appeals in these cases held the patent in suit invalid, substituting its opinion for that of the jury and the District Court without determining (1) that there was no substantial evidence to support the jury verdict or (2) that the findings of the District Court were clearly erroneous. In so doing, we submit, the Court of Appeals has deprived petitioner of its constitutional right to a trial by jury and, furthermore, has deprived petitioner of its property (its patent) without due process of law. At a minimum the lower court has so far departed from the usual course of judicial procedure as to call for the exercise of this Court's power of supervision.

I.

The jury is one of the hallmarks of the American judicial system. It is not infallible but our Founding Fathers believed so strongly in the jury system that they expressly guaranteed the right to trial by jury.

It is the jury's province to find the facts. Indeed, the Seventh Amendment expressly provides that "no fact tried by a jury, shall be otherwise reexamined in any Court of the United States, than according to the rules of the common law." The function for the Courts

in cases tried by jury is to determine whether or not there is some evidence to support the jury verdict. In *Chicago & Northwestern R'y Co. v. Ohle,* (1886) 117 U.S. 123, 129, this Court stated:

> "It is not for us to decide that the jury brought in a wrong verdict under a correct charge if the record shows, as it does, that there was some evidence to support the finding which was made."

And in *Abrams v. United States,* (1919) 250 U.S. 616, 619, this Court held that the function of the Court was:

> ". . . only to determine whether there was some evidence, competent and substantial, before the jury, fairly tending to sustain the verdict. Troxell v. Delaware, Lackawanna & Western R. R. Co., 227 U.S. 434, 442; Lancaster v. Collins, 115 U.S. 222, 225; Chicago & Northwestern Ry. Co. v. Ohle, 117 U.S. 123, 129."

In *A. & G. Stevedores v. Ellerman Lines,* (1962) 369 U.S. 355, 358-59, this Court stated:

> "We might agree with the Court of Appeals had the questions of fact been left to us. But neither we nor the Court of Appeals can redetermine facts found by the jury any more than the District Court can predetermine them. For the Seventh Amendment says that 'no fact tried by a jury, shall be otherwise reexamined in any Court of the United States, than according to the rules of the common law.' "

The Court of Appeals in these cases transcended the bounds of its power and substituted its opinion on the facts for that of the jury. In short, it reexamined the

facts contrary to the Seventh Amendment. It found the patented invention obvious whereas the jury (and the District Court) had found the patented invention unobvious. The effect of that action "is to deprive petitioner of the right to a jury trial": *Tennant v. Peoria & P. U. Ry. Co.,* (1944) 321 U.S. 29, 35. It is the duty of this Court to protect and guard that right.

II.

In *Graham v. John Deere Co., supra,* at p. 17, this Court held that validity per se was a legal issue but that the Section 103 condition (obviousness) lends itself to several basic factual inquiries. The Court did not expressly state whether or not obviousness itself was a factual issue. This void has led to clear conflict between the various Courts of Appeals. The Courts of Appeals for the Fifth and Ninth Circuits have held that obviousness is a question of law: *Swofford v. B & W, Inc.,* (5 Cir., 1968) 395 F.2d 362, 364; cert. den. 393 U.S. 935; *Hensley Equipment Company v. Esco Corporation,* (9 Cir., 1967) 375 F.2d 432, 436, while the Courts of Appeals for the Fourth and Tenth Circuits have expressly held that obviousness is a question of fact: *Mahaffy and Harder Eng. Co. v. Standard Packaging Corp.,* (4 Cir., 1968) 389 F.2d 525, 530; *Moore v. Schultz,* (10 Cir., 1974) 491 F.2d 294, 300, cert. den. —— U.S. ——. In the latter case the Court of Appeals clearly recognized this conflict stating (p. 300):

> "Although the Fifth and Ninth Circuits have taken a different view, we have held those observations to mean that non-obviousness is itself a factual question. Eimco Corp. v. Peterson Filters & Engineering Co., 406 F.2d 431 (10th Cir.); *contra* Swofford v. B & W, Inc., 395 F.2d 362 (5th Cir.); Hensley

Equipment Co. v. Esco Corp., 375 F.2d 432 (9th Cir.). Thus, within the Tenth Circuit, novelty, utility, and non-obviousness are held to require factual determinations."

This Court's comparison of obviousness to *scienter* and negligence, which are clearly fact questions, in *Graham v. John Deere Co., supra,* at p. 18 and *Blonder-Tongue v. University Foundation,* (1971) 402 U.S. 313, 331, would imply that obviousness also should be considered a question of fact. However, the Courts of Appeals for the Fifth and Ninth Circuits have not so considered it; and the Court of Appeals in these cases clearly did not consider it in that light.

The question of whether "obviousness" is a question of law or fact is an important question in the administration of the patent laws. It is a recurring question which this Court should decide now in order to bring consistency in the administration of the patent laws.

III.

The Court of Appeals in these cases, although not expressly so stating, must have considered obviousness a question of law on which it was free to substitute its opinion for that of the jury. However, it went even further. It ignored the jury findings (and those of the District Court) on the "basic factual inquiries" referred to in *Graham v. John Deere Co., supra.* The District Court clearly instructed the jury on those factual inquiries.* The District Court on respondents' motions for judgment n.o.v. also made the mandated factual in-

*No objection was made to any part of the charge to the jury in the Court of Appeals.

quiries. The Court of Appeals while referring to *Graham v. John Deere Co., supra,* made no attempt to determine whether there was probative evidence in the record to support the jury findings on those factual inquiries. It merely substituted its opinion for that of the jury. In so doing, it exceeded its powers, it usurped the power reserved for the jury, and hence deprived petitioner of its Constitutional right to trial by jury even if it is assumed that obviousness per se is a question of law.

IV.

Patents have the attributes of personal property. 35 U.S.C. Section 261. The patentee has a vested property right that can be cancelled, revoked, or amended only by judicial proceedings that afford due process of law: *Iowa State Univ. Research Found. v. Sperry Rand Corp.,* (4 Cir., 1971) 444 F.2d 406, 409.

The fundamental requisite of due process of law is the opportunity to be heard: *Grannis v. Ordean,* (1914) 234 U.S. 385, 394. But, we submit, that due process requires not only that judicial proceedings be held but that they provide the patentee with "a fair opportunity procedurally, substantively and evidentially to pursue his claim": *Blonder-Tongue v. University Foundation, supra,* at p. 333. A holding of patent invalidity, in effect, destroys a patentee's property. It amounts to a taking of his property. If the holding of invalidity is based on proceedings which so far depart from accepted standards that they do not offer a patentee such a "fair opportunity", we submit that the property, the patent, is taken without due process of law.

In these cases the Court of Appeals departed from accepted standards in the following respects:

1. It reversed a jury verdict without even purporting to determine whether there was evidence in the record to support the jury verdict.

2. It completely ignored the findings of the District Court. No reference is made in the opinion of the Court of Appeals to the holdings of the District Court on the validity of the patent.

3. It did not follow the standards announced in *Graham v. John Deere Co., supra.* Nowhere in the opinion of the Court of Appeals is there any analysis of the differences between the prior art and the claims at issue; nowhere in the opinion is there any reference to the level of ordinary skill in the art.

4. The Court of Appeals included in the prior art which it referred to and apparently relied upon a Banning Mine project which the District Court expressly held was *not* prior art and was, in fact, no more than an inchoate, abandoned idea without recognizing in any way the finding of the District Court let alone holding it was clearly erroneous.

5. The Court of Appeals held that "A new use for an old process is not patentable" citing *General Electric Co. v. Jewel Incandescent Lamp Co.,* (1945) 326 U.S. 242. However, the 1952 Patent Code expressly provides that "the term 'process' . . . includes a new use of a known process . . ." [35 U.S.C. Section 100(b)]. This provision was placed in the Patent Code *after* the *General Electric* decision to make clear that a new use for an old process is patentable, provided that the conditions of patentability are satisfied.

6. The Court of Appeals' opinion is internally inconsistent. It refers to the patented method as "an obvi-

ous combination of old elements" (App. 6a) and a "new use for an old process" (App. 6a). A method cannot be both a new (albeit obvious) combination and an old process (only a new use) at the same time.

A patent is a valuable property right. The importance of property rights was recently reaffirmed by this Court in *Lynch v. Household Finance Corp.*, (1972) 405 U.S. 538, 552, the Court stating:

> ". . . the dichotomy between personal liberties and property rights is a false one. Property does not have rights. People have rights. The right to enjoy property without unlawful deprivation, no less than the right to speak or the right to travel, is in truth a 'personal' right, whether the 'property' in question be a welfare check, a home, or a savings account. In fact, a fundamental interdependence exists between the personal right to liberty and the personal right in property. Neither could have meaning without the other. That rights in property are basic civil rights has long been recognized."

Our forefathers believed that patent property was sufficiently important to the technological growth of our country to expressly provide for it in the Constitution. Today technological growth is even more important if we are to solve our environmental and energy problems. A strong patent system is essential to that growth. However, if patent property can be destroyed in the manner that the Reinhold patent was destroyed by the Court of Appeals, after both a jury and the District Court found it disclosed and claimed a patentable advance, our patent system cannot function in its intended manner—it will be strangled slowly by judicial fiat.

CONCLUSION.

The writ should be granted (1) to sustain the integrity of the jury verdict system, (2) to clarify the scope of appellate review in patent cases, (3) to eliminate the conflict among the Courts of Appeals and (4) to strengthen the patent system.

Respectfully submitted,

JOHN M. WEBB
515 Oliver Building
Pittsburgh, Pennsylvania 15222
Counsel for Petitioner

WILLIAM H. LOGSDON and
WEBB, BURDEN, ROBINSON & WEBB, P.A.
515 Oliver Building
Pittsburgh, Pennsylvania 15222

Of Counsel

APPENDIX A

Opinion of the Court of Appeals
[filed August 5, 1974]

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

Nos. 73-1930, 73-1931, 73-1932, 73-1933

LAYNE-NEW YORK COMPANY, INC.
a corporation of the State of New York
v.
ALLIED ASPHALT COMPANY, INC.
a corporation of the Commonwealth of Pennsylvania
and
COMMONWEALTH OF PENNSYLVANIA,
Intervening Defendant.
ALLIED ASPHALT COMPANY, INC.,
Appellant in 73-1930
COMMONWEALTH OF PENNSYLVANIA, Intervenor,
Appellant in 73-1931

LAYNE-NEW YORK COMPANY, INC.
a corporation of the State of New York,
v.
B. H. MOTT & SONS, INC.,
a corporation of the State of West Virginia
and
COMMONWEALTH OF PENNSYLVANIA,
Intervening Defendant.
B. H. MOTT & SONS, INC.,
Appellant in 73-1932
COMMONWEALTH OF PENNSYLVANIA, Intervenor,
Appellant in 73-1933

Appendix A.

On Appeal from the United States District Court
for the Western District of Pennsylvania

ARGUED JUNE 10, 1974
Before STALEY, GIBBONS and WEIS, *Circuit Judges*

JOHN M. WEBB, Esq.
WILLIAM H. LOGSDON, Esq.
Pittsburgh, Pa.
Attorneys for Layne-New York Company, Inc.

FRANK E. COHO, Esq.
Pittsburgh, Pa.
Attorney for Allied Asphalt Company, Inc.

RAYMOND G. HASLEY, Esq.
Pittsburgh, Pa.
Attorney for B. H. Mott & Sons, Inc.

WALTER J. BLENKO, JR., Esq.
JAMES C. VALENTINE, JR., Esq.
Pittsburgh, Pa.
Attorneys for Commonwealth of Pennsylvania

OPINION OF THE COURT
(Filed Aug. 5, 1974)

By STALEY, *Circuit Judge.*

These are appeals from a judgment of the district court in favor of the appellee, Layne-New York Company, Inc. ("Layne-New York"), in a patent infringement action in which the appellee's patent, U.S. Patent No. 3,469,405, was adjudged valid. These appeals stem

from two actions filed against appellants Allied Asphalt Company, Inc. ("Allied") and B. H. Mott & Sons, Inc. ("Mott") in which Layne-New York charged each with infringement of the above mentioned patent. Layne-New York contended that the appellants, contractors, installed mine water barriers for the Commonwealth of Pennsylvania which required performance of the patented process. Pennsylvania was permitted to intervene in both actions. The two actions were consolidated for trial to a jury on the issue of validity.[1]

The jury returned a special verdict in which certain questions posed by the court were answered. The jury found the patent valid and that Richard H. Reinhold, manager of the core drilling department of Layne-New York at the time of the invention, was a joint inventor with John W. Foreman. On the basis of this finding, judgment was entered on the verdict for lack of full and complete title in Layne-New York.[2] Subsequently the district court granted the appellee's motion for judgment n.o.v. vacating the jury's finding that Foreman and Reinhold were joint inventors and reinstating the actions.[3] These appeals followed after the district court granted permission under 28 U.S.C. § 1292(b).

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1. Counterclaims were filed against Layne-New York by Allied, Mott and Pennsylvania.

2. Richard H. Reinhold, the appellee's assignor, was the only applicant for the patent. However, appellants argued in the district court and continued to insist on appeal that the evidence mandates a finding that John W. Foreman was a joint inventor and therefore a real party in interest. See 35 U.S.C. § 116. As the district court pointed out, all co-owners of a patent must join in an infringement suit. Rawlings v. National Molasses Co., 394 F.2d 645 (C.A. 9 1968).

3. The case was ordered restored to the trial list for purposes of determining the issues of infringement

Appendix A.

On appeal the appellants contend, *inter alia,* that the patented process was reasonably obvious to one with ordinary skill in the art at the time of the invention within the meaning of 35 U.S.C. § 103. We agree.

Pursuant to the mandate of Article I, Section 8, of the Federal Constitution, Congress enacted 35 U.S.C. § 103. See *Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp.,* 340 U.S. 147 (1950). Section 103 provides:

> "A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this Title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."

The United States Supreme Court in Graham v. John Deere Co., 383 U.S. 1, 17 (1966), has stated the following with respect to § 103:

> "* * * Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved." See *United States v. Adams,* 383 U.S. 39 (1966); *Arrow Safety Device Co. v. Nassau Fastening Co.,* .... F.2d .... (C.A.3 1974).

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and damages. All counterclaims against Layne-New York were dismissed with prejudice except those requesting declaratory judgment of non-infringement.

Appendix A.

In determining the obviousness question, this court must consider all prior art, whether or not the patentee knew of it. *Arrow Safety Device Co. v. Nassau Fastening Co.*, ... F.2d .... (C.A.3 1974); see *Mast Foos & Co. v. Stover Mfg. Co.*, 177 U.S. 485 (1900).

The patented process discloses a method of constructing a mine water barrier in an underground mine. The process involves first drilling two parallel rows of holes to the subterranean void. From the surface through the borings mineral aggregate is introduced which is then grouted (permeated with thin watery concrete) in place so as to form two spaced underground bulkheads. A third row of holes is then drilled between the first two. Cement is poured into these holes, forming a plug between the grouted bulkheads.

The prior art in this case includes methods used in three mining projects and one described in a British publication. One project is the California, Pennsylvania, State Teachers College project which involved the drilling of holes into subterranean voids, the introduction of gravel aggregate to form cones reaching to the roof of the void, and the grouting of the gravel. This method formed a hardened cylinder to support the roof against subsidence. Another one, the PAT Collier Township project, involved the use of substantially the same process to form underground cementitious supports against subsidence. A third project, the Banning Mine project, called for drilling holes into the mine, introducing aggregate, grouting the aggregate, and casting a concrete bulkhead against the grouted aggregate. The mass constructed in this fashion was to block the flow of water within the mine. Because of the discovery, after plans had been drawn, of a crosscut in the mine which

would have permitted water to flow unimpeded around the block, the proposed barrier was never constructed. Plans for the project were placed in the files of the Pennsylvania Department of Mines. The British publication was called to the attention of the patent office. The publication describes a method of filling cavities in old mines to prevent subsidence. It details the building of dams at the limits of the area to be treated and the filling of the area with concrete.

The projects outlined above were not considered by the patent office. The fact that "significant prior art not considered by the Patent Office" was brought forth by the appellant weakens the Patent Office" was brought forth by the appellant weakens the patent's presumption of validity. *U.S. Expansion Bolt Co. v. Jordan Industries, Inc.*, 488 F.2d 566, 569 (C.A.3 1973); see *Arrow Safety Device Co. v. Nassau Fastening Co.*, ... F.2d .... (C.A.3, 1973); 35 U.S.C. § 282.

We believe that the patent in question is invalid due to obviousness. The patented method is merely an obvious combination of old elements. See *Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147 (1950). Combinations of old elements may be patentable, but we do not believe that the method in question is such a patentable combination. See *National Distillers & Chemical Corp. v. Brenner*, 389 F.2d 927 (D.C.Cir. 1967). Because here the process was used as a mine water barrier rather than mere support against subsidence does not lend credence to the appellee's position. A new use for an old process is not patentable. *General Electric Co. v. Jewel Incandescent Lamp Co.*, 326 U.S. 242 (1945).

For the foregoing reasons, the judgment of the district court will be reversed.

To the Clerk:

File the foregoing opinion.

Circuit Judge

APPENDIX B

Judgment of the Court of Appeals
[entered August 5, 1974]

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

Nos. 73-1930, 73-1931, 73-1932, 73-1933

LAYNE-NEW YORK COMPANY, INC.
a corporation of the State of New York
v.
ALLIED ASPHALT COMPANY, INC.
a corporation of the Commonwealth of Pennsylvania
and
COMMONWEALTH OF PENNSYLVANIA,
Intervening Defendant
ALLIED ASPHALT COMPANY, INC.,
Appellant in 73-1930

COMMONWEALTH OF PENNSYLVANIA, Intervenor,
Appellant in 73-1931

(D.C. Civil Action No. 70-972)

Appendix B.

LAYNE-NEW YORK COMPANY, INC.
a corporation of the State of New York,
v.
B. H. MOTT & SONS, INC.,
a corporation of the State of West Virginia
and
COMMONWEALTH OF PENNSYLVANIA,
Intervening Defendant.
B. H. MOTT & SONS, INC.,
Appellant in 73-1932

COMMONWEALTH OF PENNSYLVANIA, Intervenor,
Appellant in 73-1933

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE WESTERN DISTRICT OF PENNSYLVANIA

Present: STALEY, GIBBONS and WEIS, *Circuit Judges*

JUDGMENT

These causes came on to be heard on the records from the United States District Court for the Western District of Pennsylvania and were argued by counsel.

On consideration whereof, it is now here ordered and adjudged by this Court that the judgment of the said District Court filed August 13, 1973, be, and the same is hereby reversed. Costs taxed against appellee.

ATTEST:

THOMAS P. QUINN
Clerk

August 5, 1974

APPENDIX C

Opinion and Order of the District Court
[filed August 13, 1973]

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF
PENNSYLVANIA

LAYNE-NEW YORK COMPANY, INC.,
Plaintiff,

v.

ALLIED ASPHALT COMPANY, INC.,
Defendant,

and

COMMONWEALTH OF PENNSYLVANIA,
Intervenor.

Civil Action No. 70-972

LAYNE-NEW YORK COMPANY, INC.
Plaintiff,

v.

B. H. MOTT & SONS, INC.,
Defendant,

and

COMMONWEALTH OF PENNSYLVANIA,
Intervenor.

Civil Action No. 70-973

OPINION

KNOX, District Judge

This patent case involves questions of the validity and infringement by the defendants of Patent No. 3,469,405 covering a method of preventing acid mine

drainage from coal mines. Pursuant to a proper demand for jury trial, the case was tried to a jury limited initially, however, to the following issues: (1) validity of the patent, (2) whether or not the patent applicant, Richard H. Reinhold, plaintiff's assignor was the sole or joint inventor and (3) whether or not the patent was rendered invalid as the result of inequitable conduct or fraud on the Patent Office by the inventor and by the plaintiff, his assignee. The issues of infringement and damages were not submitted to the initial jury but were reserved for future determination following the jury's answers with respect to the above question.

After eight days of trial, the jury rendered a special verdict (Appendix I) finding that Claim 1 of the patent was valid, Claim 7 was invalid, that the patent itself was valid, that there was no fraud on the Patent Office by the applicants but that one, John W. Foreman, an engineer, was a joint inventor.

As the result of the special verdict, the court entered judgment thereon (Appendix II) determining that Foreman was a joint inventor with Reinhold, that plaintiff Layne-New York, assignee of Reinhold, therefore did not possess full and complete title to the patent and therefore the complaints against the alleged infringers, Allied Asphalt Company, Inc. and B. H. Mott and Sons, Inc. were dismissed with prejudice. On the face of things, this judgment was mandated by Foreman's failure to join as an applicant for the patent (35 U.S.C. 116) and his failure to join in this action as a real party in interest and indispensable party and the fact that he

had assigned his interest therein, if any, to the Commonwealth of Pennsylvania. (See 35 U.S.C. 262.[1]

No one was happy with this result and we now have before us motions for judgment NOV or in the alternative for new trial filed by all of the parties.

The Commonwealth of Pennsylvania sought to intervene as a party defendant and by order dated December 7, 1971, we allowed the intervention. The Commonwealth claims that the method of sealing off acid mine wastes employed by it in certain projects which were prosecuted by the contractors, the original defendants in this case, were not patentable, did not constitute invention and that the Commonwealth as assignee of Foreman, possesses whatever rights that Foreman may have possessed in the patents.

We conclude as did the jury that Claim 1 of the patent (to which Claims 2 through 6 were pendent) constituted an invention, that the same was not obvious or anticipated, that no fraud on the Patent Office had been committed by either Reinhold or the plaintiff herein, but that there was no evidence justifying the jury in finding that Foreman was a joint inventor.

Claim 1 of the patent reads as follows:

> "A method of constructing from ground level a barrier for preventing water from escaping an underground entry comprising:

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1. This result was mandated by the unquestioned rule that all co-owners of a patent must join in a suit for infringement. *Rawlings v. National Mollasses Co.*, 394 F 2d 645 (9th cir 1968); *Crown Die and Tool Co. v. Nye Tool & Machine Works*, 261 US 24, 43 S Ct 254, 67 L ed 516 (1923); *Gibbs v. Emerson Electric Co.* 29 FS 810 (W.D.Mo. 1939); *Turchan v. Bailey Meter Co.* 19 FRD 201 (D.C.Del.1956).

(1) making a first row of borings from ground level into the entry and laterally across the entry;

(2) making a second row of borings from ground level into the entry and laterally across the entry, the rows being spaced from one another longitudinally in the entry;

(3) feeding and tamping sufficient mineral aggregate into each of the borings to close the entry and grouting said aggregate to form a pair of spaced support walls;

(4) drilling holes between the support walls; and

(5) filling the space between the support walls with cementitious aggregate whereby the aggregate fill and the walls will set up to form a substantially impervious water barrier in the entry."

In the court's order of December 7, 1971, allowing intervention by the Commonwealth, we stated: "Pennsylvania suffers peculiar damage by reason of a large number of abandoned coal mines whose run offs cause a great amount of pollution in the streams of the Commonwealth". Despite search and research over a long period of years, no ready solution had been found for the problem of acid mine wastes draining into the streams of Pennsylvania from these abandoned coal mines. The method described by the inventor Reinhold has enjoyed a considerable degree of success in solving this problem. We will deal with the questions in order.

Appendix C.

I. *Validity of the Patent.*

In 35 U.S.C. 101, it is provided:

"*Inventions patentable.*— Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title [§1 et seq of this title]. (July 19, 1952, c. 950, §1, 66 Stat. 797.)"

There was ample evidence to sustain the jury's verdict that the method of sealing off acid mine wastes as described by Mr. Reinhold in this patent was a novel invention unless the exceptions described in 35 U.S.C. 102 apply.[2]

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2. "*Conditions for patentability — Novelty and loss of right to patent.*—A person shall be entitled to a patent unless—

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or

(c) he has abandoned the invention, or

(d) the invention was first patented or caused to be patented by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application filed more than twelve months before the filing of the application in the United States, or

(e) the invention was described in a patent granted on an application for patent by another filed

While patent cases are seldom tried before juries, nevertheless since there was here a proper demand for jury trial and the evidence was submitted to a jury, we treat the verdict thereon the same as we would any other verdict as to determination of facts, *provided the standards and rules as to the validity of patents are observed.* Therefore, the question is whether viewing the evidence in the light most favorable to the plaintiff, the verdict winner, there is sufficient evidence subject to the legal criteria applicable to patent cases to justify the jury's finding that there was an invention here. See *Atlantic & Gulf Stevedores v. Ellerman Lines,* 369 US 355, 7 L ed 2d 798, 82 S Ct 780 (1962); *Dorberg v. Dow Chemical Co.,* 353 F 2d 963 (3d cir 1965); *Neville Chemical Co. v. Union Carbide Corp.,* 422 F 2d 1205 (3d cir 1970).

We recognize that it is the right and duty of the trial judge to direct a verdict in a patent case where the circumstances indicate that the jury has departed from the relevant legal criteria by which either a jury or a judge must be guided in their or his fact finding func-

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in the United States before the invention thereof by the applicant for patent, or

(f) he did not himself invent the subject matter sought to be patented, or

(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other. (July 19, 1952, c. 950, §1, 66 Stat. 797.)"

tion. *Berkley Pump Co. v. Jacuzzi Bros.* 214 F 2d 785 (9th cir 1954). The same standards have been adopted by the court of appeals for our circuit with respect to jury verdicts in patent cases in *Packwood v. Briggs & Stratton Corp.*, 195 F 2d 971 (3d cir 1952) where Judge Hastie said:

> "A jury in a patent case is not free to treat invention as a concept broad enough to include whatever discovery or novelty may impress the jurors favorably. Over the years the courts of the United States, and particularly the Supreme Court, have found meaning implicit in the scheme and purpose of the patent laws which aids in the construction of their general language. In this process, rules and standards have been developed for use as guides to the systematic and orderly definition and application of such a conception as invention in accordance with what the courts understand to be the true meaning of the Constitution and the patent laws. Once such standards and rules are authoritatively announced any finding of 'invention' whether by a court or a jury must be consistent with them.
>
> "This is no peculiarity of patent law. Jury findings of negligence or proximate cause must comport with common law rules devised to give reasonable and systematic meaning to those generalities. *** And so it is throughout the body of the common law. This authority and responsibility to keep jury findings within reasoned rules and standards is an essential function of United States judges today as it long has been of common law judges. *** It stands as a great safeguard against gross mistake or caprice in fact finding."

This view was reiterated by the court in *Nachtman v. J&L Steel Corp.*, 235 F 2d 211 (3d cir 1956).

The court here unequivocally states, however, that its view of the evidence in this case is the same as that of the jury with respect to patentability; that under the standards and rules applicable to patents the method described in this patent constitutes a valid invention; that there was novelty in this invention; that there was no anticipated prior use; and that none of the other exceptions described in 35 U.S.C. 102 and 103, were operating in this case. The question of whether Reinhold was the *sole* inventor will be discussed later.

The evidence shows that abandoned mines have been a problem which has frustrated the Commonwealth of Pennsylvania for years. Acid formed by water combined with the sulphur elements in coal in such mines has contaminated the streams of this state and constitutes a health hazard to persons making use of these waters, which are thus polluted, whether for recreation or consumption. Pennsylvania has spent considerable amounts of money and time unsuccessfully seeking a solution to this problem.

Prior to the development of the Reinhold patent, there were three methods used in attempts to stop acid mine drainage. One involved opening the mine entry of the abandoned mine, excavating back into it and putting up a dam across the entryway as a plug. Second was to drill a series of holes from the surface into the mine and put in low slump or thick concrete to build up a dam or plug. Third was the bag method employed by the Halliburton Company which involved pumping concrete into a bag inserted into the mine through a hole drilled from the surface. The first method involved

considerable cost in locating the mine entry and cutting back into the land a substantial distance to provide a flat face where a dam structure could be constructed. None of the three methods was effective because mine water when obstructed by any of these methods would usually find its way through adjacent fissures in the land and thence into a stream below.

The novelty in Reinhold's method is clearly described in his Claim 1 to which Claims 2, 3, 4, 5 and 6 are pendent. It involves initially two rows of borings made from the surface into the mine entry 20 or 30 feet apart and then filling the mine entry from each row with aggregate which is then permeated with grout (a cementitious material) so as to form two support walls across the entry. A third row of borings is then made between the other two and into this is poured a cementitious aggregate to form what is called "a plug". The combination of the two spaced bulkheads with the plug in the center forms a substantially impervious water barrier in the mine entry preventing the escape of acid mine drainage.

Defendants and the intervenor claim that this method is not new that it was anticipated for some years prior to January 1968 when Reinhold's method was disclosed to Foreman and that the method used was obvious.

During the year 1967, the Commonwealth became interested in a project for building a new park between Butler and New Castle, Pennsylvania, known as Moraine State Park containing approximately 16,000 acres of land and a 3,225 acre lake, Lake Arthur. This would provide public facilities for boating, swimming, fishing, picnicking, ice skating, skiing, camping and nature

studies. It was obviously not practical to proceed with development of the park until the problem of acid mine waste drainage into the streams in the area had been solved.

In May, 1967, the Pennsylvania Department of Mines and Mineral Industries which has since become a part of the Department of Environmental Resources engaged Gwin Engineers, with which Foreman, a consulting engineer, was connected, to perform research and development relative to the elimination of acid mine drainage at Moraine State Park and to make recommendations for this purpose. During the course of this project, Gwin, through Foreman, requested assistance from Reinhold in solving the problem. Reinhold made an initial suggestion providing for only a single barrier which was rejected as unsatisfactory. Thereafter, during January 1968, he came forward with the method described in the patent for two barriers constructed through holes bored from the surface with a center plug in between likewise constructed through holes bored from the surface.

At first, Gwin was somewhat skeptical of this method and the Commonwealth was obviously hostile until the method had been constructed and proved. Plaintiff then, together with Gwin, constructed a test mine water barrier in a mine near Altoona, Pennsylvania, which was completed in July or August 1968 and proved a success.

The jury in this case was throughly instructed as to the requirements for issuance of a patent and the necessity of determining whether this was a real invention for which a patent should have been issued. (See Court's charge N.T. 736, et seq.) The jury was told that the law presumed the patent to be valid, that such presumption

should not be overthrown except by clear and cogent evidence and that the burden of establishing the invalidity of a patent rested on the party asserting it. (See 35 U.S.C. 282). The jury was told to consider the question of obviousness and also what constituted a valid combination patent, whether a new and unusual result had been produced. They were also told to consider the question of anticipation by reference to prior art, i.e., "the body of information existing at the time". It was pointed out that the question to be determined was whether it was non-obvious to a person having an ordinary skill in a pertinent art, whether it was obvious to a person ordinarily skilled at a particular branch of business or work. The court was also instructed as to prior use of the invention with particular respect to the various matters that had been brought up particularly schemes for building pillars and supporting buildings. It would thus seem that all the questions of prior public use, anticipation, prior art and obviousness were brought to the jury's attention with proper instructions and considered by them.

For instance, 35 U.S.C. 103 provides a good summary of the law in this area.[3]

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3. *"Conditions for patentability — Non-obvious subject matter.* A patent may not be obtained though the invention is not indentically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made. (July 10, 1952, c. 950, §1, 66 Stat. 798.)"

Appendix C.

In *Trio Process Corp. v. L. Goldstein Sons, Inc.*, 461 F 2d 66 (3d cir 1972), the court said in defining "Prior Art" as "The existing state of knowledge in a particular art at the time an invention is made—it includes the issued patents, publications and all other knowledge deemed to be common thereto such as trade skills, trade practices and the like."

It is also obvious that unpublished documents or private discussions not of common knowledge do not fall within the scope of the limitations contained in 102 and hence are not prior art within the meaning of 103. Prior knowledge and use must have been accessible to the general public. *Minneapolis Honeywell Regulator Co. v. Midwestern Instruments, Inc.*, 298 F 2d 36 (7th cir 1961); *Gillman v. Stern*, 114 F 2d 28 (2d cir 1940).

Vague undeveloped notions, proposals and plans are not prior art. An invention is known or used when it is reduced to practice. Mere confidence that it will work is not enough. See *Stearns v. Tinker & Rasor*, 220 F. 2d 49 (9th cir 1955). Under Section 102(b), an invention is not patentable if in public use *or sale for one* year prior to the application. Also under 102(g) we have the question whether the invention, if made by another, was abandoned, suppressed, or concealed. However, it has been held that it is deemed abandoned, suppressed or concealed if, within a reasonable time, no steps are taken to make the invention publicly known. See *International Glass Co. v. U.S.*, 408 F 2d 395 (Court of Claims 1969).

Turning to the evidence presented as to prior art, anticipated use, obviousness and whether the alleged prior invention was in public use or on sale, we find that the evidence is not convincing and is insufficient to upset the statutory presumption of validity. It is pro-

vided in 35 U.S.C. 282: "A patent shall be presumed valid. The burden of establishing invalidity of a patent shall rest on the party asserting it." The jury was instructed that "when the prior art, i.e., the body of information available to inventors at the time is not considered by the Patent Office, the statutory presumption of validity ordinarily attached to the patent grant is weakened." (N.T. 737) This was taken from *Chemical Construction Corp. v. J.&L. Steel Corp.,* 311 F. 2d 367 (3d cir 1972).

When consideration is given to the alleged anticipated uses, the prior art, the matters brought to the attention of the Patent Office and reference to a similar proposal which was not used, the evidence is not convincing to upset the presumption of validity of this patent.

The prior anticipated uses which were brought to the attention of the court and jury in this case were as follows:

(1) the California Pennsylvania State Teachers College project,

(2) the PAT Collier Township project,

(3) reference in a British Publication (Plaintiff's Ex. 11), and

(4) the Banning Mine project.

The jury was not impressed with any of these as indicating a prior anticipated use which would deny validity to this invention. The California State Teachers project and the PAT Collier Township project involved the use of bored holes to construct pillars to support buildings on the surface of the property. Neither of

these projects involved the building of two barriers with a concrete plug in between so as to prevent the passage of water from a mine.

The same is to a large extent true of the British publication which involved the construction of a dam or bulkhead around an area and then filling in the holes inside so as to support a building on the surface. The British publication was called to the attention of the Patent Office, the other two were not since Reinhold the alleged inventor, thought them not similar and the jury felt the same way in its verdict.

The Banning Mine Proposal Number 4 merits more serious consideration because it did involve a construction of some sort of a barrier for the purpose of closing off water. The evidence showed that the Banning Mine ran under a river and that the purpose was to seal off the river water from the rest of the workings. This plan was worked up in 1966 and presented to satisfy a Pennsylvania State Mining Commission to determine whether the plan was safe or unsafe and whether feasible or not. The proposal involved the construction of a bulkhead with gravel grouted in from two holes in the surface in order to shut off the flow of the water. These plans and proposals were filed with the Pennsylvania Department of Mines but the barrier in question was never constructed and after plans had been drawn up for this construction, it was discovered that there was another entry or crosscut which existed which would have bypassed the water around the bulkheads which they intended to install and so the plan was abandoned. (See Reed N.T. 326).

The question therefore is whether under Section 102 Reinhold's invention as described in this patent was

known or used by others in this country or whether the invention was in public use or on sale in this country more than one year prior to the date of the application in the United States. See 18 U.S.C. 102(a) and (b). Also under 102(g) the question is whether the invention was made in this country by another who had not *abandoned,* suppressed *or* concealed it.

The statute cautions us to consider the reasonable diligence of one who has first conceived and was the last to reduce the plan to practice.

We hold and the jury so found that the Banning Mine Plan did not bar the validity of the patent in question. Under this section of the act, the device must not be inchoate, it must function and it must reach consumation. See *Stamicarbon N.V. v. Escambia Chemical Corp.,* 430 F 2d 920 (5th cir 1970), where it was said:

> " 'If the thing were embryotic or inchoate; if it rested in speculation or experiment; if the process pursued for its development had failed to reach the point of consummation, it cannot avail to defeat a patent founded upon a discovery or invention which was completed; while in the other case there was only progress, however near that progress may have approximated to the end view. The law requires, not conjecture, but certainty.' "

For this patent to have been barred by the Banning Mine process, it must have been shown that it was more than a plan on paper. It must have functioned. The evidence showed clearly that it did not. For whatever reason makes no difference.

We therefore hold that the Reinhold patent meets the essential tests for patentability, viz: utility, novelty

and non-obviousness. See *Harrington Manufacturing Co., Inc. v. White* 475 F 2d 788 (5th cir 1973). We further hold that the Banning Mine Plans had been abandoned and were never in public use or on sale in this country. It is true that a copy of these plans was filed with the Pennsylvania Department of Mines but we do not hold that such filing of the plans would amount to description of the device in a printed publication in this or a foreign country as required by 35 U.S.C. 102(a). Reinhold was obviously the person who first reduced this plan to practice and while the Banning Plan was disclosed to the Bureau of Mines, the plans lay there gathering dust unknown to anybody including Reinhold until the circumstances and investigation attendant upon this case brought it to light.

While commercial success is not necessarily proof of validity, nevertheless insofar as it is to be considered, the evidence shows that this invention by Reinhold was a successful method and was used successfully by the Commonwealth at Moraine State Park. See N.T. 482, 484, Plaintiff's Exhibit 19 and 43.

Appendix C.

II. *Fraud on the Patent Office*

The jury, as noted, was asked whether there were such wilful acts including nondisclosure, concealment, false representation or other inequitable conduct in connection with the patent application as to render the patent invalid and the jury answered "No". The jury was instructed at page 743, et seq. as to inequitable conduct which would invalidate a patent and were told that such misconduct must be shown by clear and convincing proof. The jury was told that an application before the Patent Office stands in a confidential relationship and owes the duty of frank and truthful disclosure to the Patent Office of everything that had gone on before with respect to what he is trying to patent.

Reinhold did not call the attention of the Patent Office to the projects at California, Pennsylvania, or the Collier Township project which involved the construction of pillars to support a building on the surface because he did not consider them pertinent. The jury agreed with him and so does the court for reasons hereinbefore set forth. He had no knowledge of the Banning Mine Plan and cannot be faulted for not bringing this to the attention of the Patent Office. He did bring to their attention the British publication which involved a different type of construction for underpinning buildings. With respect to the Banning Mine plan, the jury was told (742) that the question they were to consider was whether Reinhold knew or should have known about this plan or what was in the record of the Department of Mines. It appears that Reinhold did disclose all relevant matters to the Patent Office.

Finally the defendants charge that Reinhold was guilty of inequitable conduct in not making full dis-

closure to the Patent Office that the engineer, Foreman, was a co-inventor of the patent. We will deal with Foreman's standing in this case in the next branch of this opinion but suffice it to say that the evidence shows that there was no basis for applicant disclosing to the Patent Office that Foreman had done the drafting work in connection with the plans for the mine barrier. Foreman himself, as will be pointed out, did not consider himself as an inventor but merely a draftsman and Reinhold so regarded him. The testimony is clear that Reinhold informed Gwin Engineers and Foreman that he was applying for a patent on this barrier but they paid no attention to this advice. They considered the device not patentable.

We recognize that the granting of patents must be free from fraud or other inequitable conduct. *Precision Co. v. Automotive Co.*, 324 US 806, 68 S Ct 993, 89 L ed 1381 (1945); and that our own Circuit has adopted rigid standards with respect to these matters holding that concealment and disclosure may be evidence of and equivalent to a false representation because a concealment or suppression is in effect a representation that what is disclosed is a whole truth. *Monsanto Co. v. Rohm and Haas Co.*, 456 F 2d 592 (3rd cir 1972). We note that in that case a finding of misrepresentation by the lower court was affirmed and that from the information submitted, the Patent Office could not make a fair appraisal of the application, particularly since the applicant failed to reveal to the Patent Office that a prior application had been rejected. The court held that an applicant seeking a patent monopoly must exercise a degree of candor and disclosure commencement with equitable standards of conduct.

We find no convincing evidence in this case that Reinhold fell short of the standards thus imposed by the Supreme Court and by our own Court of Appeals and the jury obviously came to the same conclusion.

III. *The Question of Foreman as Co-inventor.*

The question of the effect of a finding of co-inventorship on enforcement of a patent involves an excursion into what has recently been described by Judge Newcomer in the Eastern District of Pennsylvania in *Mueller Brass Co. v. Reading Industries, Inc.* 352 FS 1357 (1972) as "one of the muddiest concepts in the muddy metaphysics of the patent law".

In the year 1934, our Court of Appeals in *Altoona Publix Theatres v. American Triergon Corporation,* 72 F 2d 53 (CA 3d 1934) had this to say about joint inventors:

> "The first question arises as to what constitutes joint invention of two or more persons. The authorities are unanimous in holding that joint inventions are made when two or more persons jointly work or collaborate in devising and putting into practical form the subject-matter of the patent in question. Robinson on Patents, vol. 1, p. 567, says:
>
> " 'It is not necessary that the same idea should occur simultaneously to each. On the contrary, it is immaterial who first conceives any particular theory or plan of the invention or in what order the development of its subordinate ideas proceeds. Where two or more inventors have agreed that a result, if it could be achieved, would be desirable, neither as yet having attempted to provide a means, and from this point go forward by mutual consulta-

tions and suggestions to devise one, the means devised becomes a joint invention. * * * In short, wherever, before the entire conception of the invention by one inventor, another meets him and by his consent unites with him in exercising inventive skill upon the development and perfecting of the conception, the product of their joint endeavor is a joint invention. * * *

" 'The same variety is possible in the exterior relations of the joint inventors, where the inventive act consists in the repeated trial of experiments. The exact part which each performs is of no consequence. Nor does it matter that one has been experimenting long in vain, nor even that he may have made some actual advance toward the discovery to which he aspires. It is enough if the experiment which finally succeeds — the one which demonstrates the practicability of accomplishing the end in view and indicates the means by which it is attainable — has been conducted under their united supervision, and in accordance with ideas and theories to which both have contributed.' "

Judge Newcomer in *Mueller Brass Co., supra,* discussed the matter at length:

"On the one hand, it is reasonably clear that a person who has merely followed instructions of another in performing experiments is not a co-inventor of the object to which those experiments are directed. To claim inventorship is to claim at least some role in the final conception of that which is sought to be patented. Perhaps one need not be able to point to a specific component as one's sole idea, but one must be able to say that without his

contribution to the final conception, it would have been less — less efficient, less simple, less economical, less something of benefit This Court has found no case in which co-inventorship status was recognized where the alleged co-inventor was not deemed in some way at least presumptively, to have beneficially affected the final concept of the claimed invention, and if such a case exists, would be so anomalous as to warrant little attention.

"When an infringer claims that someone is on a patent as inventor who shouldn't be, 'this defense has always been regarded as technical, and is looked upon with disfavor by the courts (footnote omitted), and clear and convincing proof is required to sustain it'. Deller's Walker on Patents, supra, §42.

* * *

"It is worth observing here that non-joinder has often been treated more harshly than misjoinder, even when raised by a third party, because of the more suspicious nature of a failure to give credit initially to one entitled to credit. Even here, however, the courts have been reluctant to strike down patents for non-joinder on challenges by third party infringers.

"In this context, we find the doctrine of 'mere suggestions' which denies co-inventorship status to a person who suggests some way to improve an invention casually but takes no further role in fitting the rough suggestion into the scheme of the invention workably. See *Forgie v. Oilwell Supply Co.*, 58 F 871 (3d cir 1893).

"Further, we find the doctrine of employee improvement, which holds that an employee engaged in experiments to perfect another's concept does not become a co-inventor even if he suggests an improvement, unless the improvement is so significant as to amount to 'a complete invention' in and of itself. See *Agawam Woolen Co. v. Jordan,* 74 (Wall) U.S. 583, 19 L ed 177 (1869)."

It will be noted that in the cases cited the trier of fact determined that there was a joint invention. In the instant case the triers of fact, the jury, made a similar finding and the question therefore is whether there is sufficient evidence to support such a finding. The jury in its special verdict clearly stated that Reinhold was not the sole inventor and that Foreman was the joint inventor with him. We conclude that there was insufficient evidence in the record to support the jury's verdict in this respect in answering questions 1 and 2, that these answers must be set aside and therefore the judgment entered upon the verdict must be set aside also and judgment NOV entered in favor of the plaintiff.

At no time during the pendency of this law suit did the co-inventor, Foreman, seek to intervene as a party plaintiff or state his claim to be co-inventor upon the record. Rather this defense was asserted by the alleged infringers, to wit: the contractors and the Commonwealth of Pennsylvania for whom they were working. Foreman himself at the trial said he did not consider himself a co-inventor and further that he did not consider that the invention was patentable. It was only after the verdict finding him, notwithstanding these assertions, to be a co-inventor that he executed an

assignment of his interest in the patent to the Commonwealth of Pennsylvania. This assignment apparently came as an after thought after verdict. If it was not, there is no reason apparent why any such assignment of any such interest should not have been made at the earliest moment after this suit was brought. The evidence is further clear that Reinhold, the applicant for the patent, did nothing to conceal the patent pendency of the application from Foreman or his employer Gwin Engineering. Instead, Reinhold told them in January 1968 that he intended to apply for a patent and neither Foreman nor Gwin made any attempt to represent that either of them was a co-inventor to the Patent Office during the pendency of the patent proceedings.

Reviewing all the testimony in this case, it becomes readily apparent that there is no substantial evidence supporting the jury's finding that John W. Foreman was a co-inventor of the process described in this patent and he himself never contended that he was.

It will be borne in mind that the Gwin Engineering firm was engaged by the Commonwealth for the purpose of coming up with a solution to the problem of acid mine drainage at Moraine State Park. Mr. Foreman's testimony was that after study of the situation, they had determined late in 1967 to use a concrete plug and had considered the various methods of installing the concrete plug which were known at that time, viz: the construction of a dam by opening up the mine entries; secondly the Halliburton bag method whereby concrete is inserted into a bag through a hole drilled from the surface; and finally the use of low slump concrete. (See pages 284, 285). In any event, they had determined in late 1967 to use a concrete plug of some sort. Mr. Rein-

hold was then consulted as to the best method of installing such a plug. He originally came up with the idea of constructing a single bulkhead and putting grout on it as the seal and was told that this would not be satisfactory and he then returned with the idea which is the subject of the patent, viz: two barriers with a center plug in between. Mr. Foreman himself said at pages 453-454:

> "It was Mr. Reinhold's initial intent to use a single bulkhead and grout the middle of it as a seal. It was my insistence that this would not be satisfactory that I had a concrete center plug. This is what I wanted to install. Then he came back and said, 'Well, put another row behind it and that will hold it'. That is as simple as I can put it."

Further in his testimony (pages 455-456), Mr. Foreman clearly took himself out of the picture as a co-inventor with the following testimony:

> "This morning specifically with respect to Commonwealth Exhibit 10 or 11, both of them, you stated that you considered yourself to be the designer of what is shown on those drawings. The question is do you consider yourself to be the designer of everything which you put down on paper no matter where you got the ideas for it?
>
> "I am a little confused as to the definition of 'designer'. If you design and compile certain engineering principles, yes, I put this plan together.
>
> "All right. Do you consider yourself the designer of the double bulkhead to contain the center plug?
>
> *"I would consider myself the designer of the engineering details as distinguished, let's say, from*

the inventor. I have no claim to being the inventor. As to designing the details for this particular double bulkhead seal, I am the designer, yes.

"You are the designer of the details as distinguished from the inventor of the engineering concept?

"Well, I am hung up a little bit here too as to the difference between the engineering concept and the inventor concept. *To invent is one thing; to design something using known principles is something else again. I take no claim to inventing anything at all,* but the compilation of existing practices and putting them together into one plan, I am the author, the compiler of let's say Commonwealth Exhibit 11, which is the final plan that we have here.

"But you take no credit for the engineering concept of a double bulkhead seal and the double bulkhead being used as a form for a center plug?

"If it is to mean the invention, no."

As has been pointed out, Mr. Foreman's conduct in not making himself known as a co-inventor or claiming to be such until the trial of this case is inconsistent with any claim that he was a co-inventor. He was aware that Reinhold was applying for a patent (See N.T. 122, 436, 457) but never asserted that he was in the position of an inventor or co-inventor. While he had been thinking about building a concrete plug (N.T. 282), it is clear that this only involved a plug of some sort, not the plug which was used in the Reinhold patent.

There is no testimony in this case that Foreman did anything other than reduce the plans to final form as a

draftsman and prepare the final specifications after consulting with Reinhold who was an expert on grouting (N.T. 351 and 412). The things which Foreman contributed to the plans were at most minor details which would not entitle him to consideration as a co-inventor.

It is true that the plaintiffs and Gwin Engineering participated in building a test seal in a mine in Altoona, Pennsylvania, in June 1968. While Gwin participated in the financing of this and was desirous of satisfying the Commonwealth, it is clear that the work was done by Layne-New York. (See N.T. 462, 475). This test seal in Altoona was a success and led to the Commonwealth's adopting it for use at Moraine State Park. The basic ideas which Reinhold disclosed were not changed as the result of this work. (See N.T. 65). The double seal with the concrete plug was Reinhold's idea. (N.T. 352, 353). Mr. Foreman also testified at page 454:

> "Your letter of May 15, 1970, states on page 2, does it not, 'it was their suggestion' referring to Layne-New York 'to construct a row of these piers across the entry to make a bulkhead or form to contain the center plug'?
>
> "That is the way it is stated in the letter, yes.
>
> "And that is correct, is it not?
>
> "Yes".

Aside from Foreman's own testimony, there is no evidence in this case which makes him out a joint inventor on the process described in the Reinhold patent. All the other evidence is consistent with what has been said before, namely, that the idea was Reinhold's and Foreman was only a draftsman.

In the light of the foregoing, it is necessary that judgment NOV be entered in favor of the plaintiffs in each of these cases as to the validity of the patent and the case will be restored to the trial list for determination of the remaining issues of infringement and damages.

We therefore will grant the motion for judgment notwithstanding the verdict in accordance with plaintiff's motion for directed verdict previously presented and denied. In accordance with Rule 50(c) we rule with respect to plaintiff's motion for new trial that it should be granted if the judgment now entered is hereafter vacated or reversed since the jury's finding that Foreman was a co-inventor is against the overwhelming weight of the evidence in this case.

Appendix C.

ORDER

AND NOW, to wit, August 13, 1973, the plaintiff having moved for judgment notwithstanding the verdict in accordance with its motion for directed verdict presented at trial and not granted and the jury empaneled in these actions having returned a special verdict on December 13, 1972, pursuant to which judgment was entered on December 14, 1973, and for reasons set forth in the foregoing opinion, the court having determined that the jury's finding that Reinhold was not the sole inventor of U.S. Patent 3,469,405 and that John W. Foreman was a joint inventor with him is unsupported by the evidence but that the balance of the verdict is supported by the evidence,

IT IS ORDERED that the judgment on the verdict entered December 14, 1973, be and the same hereby is vacated and in lieu thereof,

IT IS ORDERED, ADJUDGED AND DECREED as follows:

(1) John W. Foreman is not a joint inventor with Richard H. Reinhold of the subject matter of Claim 1 of Reinhold Patent 3,469,405 and, on the contrary, Richard H. Reinhold was the sole inventor of the said subject matter.

(2) Plaintiffs possess full and complete title in and to Reinhold Patent 3,469,405 and have capacity to bring and maintain these actions.

(3) Claim 1 of patent 3,469,405 (to which are pendent claims 2, 3, 4, 5 and 6) of which Richard H. Reinhold was the inventor is hereby determined to be a valid patent.

(4) Neither Richard H. Reinhold nor plaintiff were guilty of any fraud or inequitable conduct in connection with the patent application which would invalidate it.

(5) Claim 7 of Patent 3,469,405 is determined to be invalid.

(6) Counterclaims of Allied Asphalt Company, Inc. and B. H. Mott & Sons, Inc. against the plaintiff are dismissed with prejudice.

(7) The case is ordered restored to the trial list of the undersigned for the purpose of determining the issues of infringement and damages against the defendant Allied Asphalt Company, Inc., in 70-972 and B. H. Mott and Sons, Inc. in 70-973 and the Commonwealth of Pennsylvania as intervening defendant in both cases.

(8) The motions of the defendants and the intervenor, the Commonwealth of Pennsylvania, for judgment notwithstanding the verdict or alternatively for a new trial are denied.

WILLIAM W. KNOX
United States District Judge

CC:
All counsel
JOHN WEBB, Esq.
1502 Oliver Bldg. 15222
RAYMOND HASLEY, Esq.
919 Oliver Bldg. 15222
WALTER BLENKO, Esq.
1020 N. Amer. Rockwell Bldg. 15222
FRANK COHO, Esq.
1410 Grant Bldg. 15219

Appendix C.

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

LAYNE-NEW YORK COMPANY, INC., Plaintiff,
v.
ALLIED ASPHALT COMPANY, INC., Defendant,
COMMONWEALTH OF PENNSYLVANIA, Intervenor
Civil Action No. 70-972

LAYNE-NEW YORK COMPANY, INC., Plaintiff,
v.
B. H. MOTT & SONS, INC., Defendant,
COMMONWEALTH OF PENNSYLVANIA, Intervenor
Civil Action No. 70-973

SPECIAL VERDICT

In accordance with instructions of the court, the jury hereby finds as follows:

(1) Did Mr. Reinhold conceive the subject matter of U.S. Patent No. 3,439,405 solely?

ANSWER: No.
"yes" or "no"

(2) If your answer to the first question is "no", whom do you find to be the joint inventor with him?

ANSWER: John W. Foreman.

(3) Did Mr. Reinhold and/or Layne-New York engage in such willful acts including non-disclosure, con-

cealment, false representation or other inequitable conduct in connection with the application to the Patent Office as to render the patent invalid?

ANSWER: No.

"yes" or "no"

(4) Under the instructions of the court, do you find Patent No. 3,469,405, of which Richard Reinhold claims to be the inventor, a valid patent?

ANSWER: Yes.

"yes" or "no"

(5) Do you find Claim 1 of the patent to be valid or invalid?

ANSWER: Valid

"valid" or "invalid"

(6) Do you find Claim 7 of the patent to be valid or invalid?

ANSWER: Invalid

"valid" or "invalid"

(Do not for this purpose consider Claims 1 through 6.)

Dec. 13, 1972

SYLVESTER L. ZWIGART
Foreman

ROBT. C. RANSICK
JAMES C. HILL
ELMER J. LANG
MERCEDES MACK
WILLIAM B. O'TOOLE
GEORGE K. WRIGHT
CARMELLA R. MASON

Appendix C.

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

LAYNE-NEW YORK COMPANY, INC., Plaintiff, v. ALLIED ASPHALT COMPANY, INC., Defendant, COMMONWEALTH OF PENNSYLVANIA Intervenor,	Civil Action No. 70-972
LAYNE-NEW YORK COMPANY, INC., Plaintiff, v. B. H. MOTT & SONS, INC., Defendant, COMMONWEALTH OF PENNSYLVANIA Intervenor,	Civil Action No. 70-973

JUDGMENT ON VERDICT

AND NOW, to wit, December 14, 1972, a jury empanelled in these actions having returned a Special Verdict on December 13, 1972,

IT IS ORDERED, ADJUDGED AND DECREED as follows:

(1) John W. Foreman is a joint inventor with Richard H. Reinhold of the subject matter of Claim 1 of Reinhold Patent 3,469,405.

(2) Plaintiff does not possess full and complete title in and to Reinhold Patent 3,469,405 and lacks capacity to bring and maintain these actions.

APPENDIX II

(3) The complaints herein against Allied Asphalt Company Inc. and B. H. Mott & Sons, Inc. are dismissed with prejudice.

(4) The counterclaim of Allied Asphalt Company, Inc. and B. H. Mott & Sons, Inc. against plaintiff are dismissed with prejudice.

(5) The counterclaims of plaintiff against the Commonwealth of Pennsylvania are dismissed with prejudice.

The foregoing form of judgment is hereby approved and the Clerk is directed to enter the same pursuant to Rule 58.

WILLIAM W. KNOX
United States District Judge

APPENDIX D

District Court Order of August 23, 1973

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

LAYNE-NEW YORK COMPANY, INC.,
Plaintiff,
v.
ALLIED ASPHALT COMPANY, INC.,
Defendant, and
COMMONWEALTH OF PENNSYLVANIA,
Intervenor.

Civil Action No. 70-972

LAYNE-NEW YORK COMPANY, INC.,
Plaintiff,
v.
B. H. MOTT & SONS, INC.,
Defendant, and
COMMONWEALTH OF PENNSYLVANIA,
Intervenor.

Civil Action No. 70-973

ORDER

IT IS ORDERED, DECREED AND ADJUDGED that Paragraph (6) of the Order of this Court dated August 13, 1973 be amended to read:

> (6) All counterclaims of Allied Asphalt Company, Inc., B. H. Mott & Sons, Inc., and the Commonwealth of Pennsylvania against the plaintiff are dismissed with prejudice except counterclaims requesting declaratory judgment of non-infringement of Reinhold Patent 3,469,405.

s/ WM. W. KNOX
United States District Judge

August 23, 1973

APPENDIX E

District Court Order of August 24, 1973

IN THE UNITED STATES DISTRICT COURT FOR THE WESTERN DISTRICT OF PENNSYLVANIA

LAYNE-NEW YORK COMPANY, INC., a corporation of the State of New York, Plaintiff, v. ALLIED ASPHALT COMPANY, INC., a corporation of the Commonwealth of Pennsylvania, Defendant, COMMONWEALTH OF PENNSYLVANIA Intervenor.	Civil Action No. 70-972
LAYNE-NEW YORK COMPANY, INC., a corporation of the State of New York, Plaintiff, v. B. H. MOTT & SONS, INC., a corporation of the State of West Virginia, Defendant, COMMONWEALTH OF PENNSYLVANIA, Intervenor.	Civil Action No. 70-973

FINDING AND ORDER OF APPEALABILITY AND STAY OF PROCEEDINGS

Now, this 24th day of August, 1973 the defendants having filed a petition on August 23, 1973, to alter or amend the judgment of this Court entered August 13, 1973 (pursuant to Civil Rule 59 (e)), to clarify

whether said judgment is interlocutory or final, and the matter having been fully argued by attorneys for all parties, and said judgment having been modified in one respect (paragraph No. 6 of said judgment), this Court is of the opinion and finds that the Order or Judgment of August 13, 1973, whether or not otherwise appealable, involves controlling questions of law on (1) invention and (2) ownership of the patent involved, as to which there is substantial ground for difference of opinion and that an immediate appeal from the Order of August 13, 1973 may materially advance the ultimate termination of the litigation by finally determining those questions before trial of the issues of infringement and damages, and it is, therefore,

ORDERED, ADJUDGED and DECREED THAT

(1) In accordance with the United States Code, Title 28, Judiciary And Judicial Procedure, Section 1292 (b), the Order or Judgment of this Court dated August 13, 1973, as amended, involves controlling questions of law entitled to immediate appeal to materially advance the ultimate termination of the litigation in these cases.

(2) All proceedings in the District Court are hereby stayed until failure of any defendant to appeal or to have appealed from the Order or Judgment of this Court of August 13, 1973 within 10 days of this Order or disposition of the appeals so filed is made by the United States Circuit Court For The Third Circuit.

United States District Judge

/s/ WILLIAM W. KNOX

August 24, 1973

APPENDIX F

Order of the Court of Appeals
[filed September 26, 1973]

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

C. A. Misc. Record No. 73-8136

LAYNE-NEW YORK COMPANY, INC., a corporation of the State of New York

v.

ALLIED ASPHALT COMPANY, INC., a corporation of the Commonwealth of Pennsylvania,

COMMONWEALTH OF PENNSYLVANIA, Intervenor
(D. C. Civil No. 70-972)

LAYNE-NEW YORK COMPANY, INC., a corporation of the State of New York,

v.

B. H. MOTT & SONS, INC., a corporation of the State of West Virginia,

COMMONWEALTH OF PENNSYLVANIA, Intervenor
(D. C. Civil No. 70-973)

Allied Asphalt Company, Inc., defendant in Civil No. 70-972, and B. H. Mott & Sons, Inc., defendant in Civil No. 70-973, and The Commonwealth of Pennsylvania, intervenor in Civil Nos. 70-972-3,

Petitioners

Present: BIGGS, ADAMS and ROSEN, Circuit Judges

Upon consideration of application by petitioners, Allied Asphalt Company, Inc., and B. H. Mott & Sons, Inc., defendants in civil actions 70-972 and 70-973, Western District of Pennsylvania, and the Commonwealth

of Pennsylvania, intervenor in said actions, for permission to appeal pursuant to 28 U.S.C. Section 1292 (b) from the order of the United States District Court for the Western District of Pennsylvania dated August 13, 1973 as amended by order dated August 24, 1973, all in the above-entitled case, it is ordered that petitioners, Allied Asphalt Company, Inc., B. H. Mott & Sons, Inc., and the Commonwealth of Pennsylvania be and hereby are granted leave to appeal pursuant to the provisions of 28 U.S.C. Section 1292(b) See Rule 5, Federal Rules of Appellate Procedure.

By the Court,

ARLEN M. ADAMS
Circuit Judge

Judge Biggs dissents
Dated: September 26, 1973

APPENDIX G

Two Orders of the Court of Appeals

[filed November 22, 1974]

UNITED STATES COURT OF APPEALS
For The Third Circuit

NOS. 73-1930, 73-1931, 73-1932, 73-1933

LAYNE-NEW YORK COMPANY, INC., a corporation of the State of New York

v.

ALLIED ASPHALT COMPANY, INC., a corporation of the Commonwealth of Pennsylvania and COMMONWEALTH OF PENNSYLVANIA, Intervening Defendant

ALLIED ASPHALT COMPANY, INC., Appellant in No. 73-1930

COMMONWEALTH OF PENNSYLVANIA, Intervenor, Appellant in No. 73-1931

LAYNE-NEW YORK COMPANY, INC., a corporation of the State of New York

v.

B. H. MOTT & SONS, INC., a corporation of the State of West Virginia and COMMONWEALTH OF PENNSYLVANIA, Intervening Defendant

B. H. MOTT & SONS, INC., Appellant in No. 73-1932

COMMONWEALTH OF PENNSYLVANIA, Intervenor Appellant in No. 73-1933

Before STALEY, GIBBONS and WEIS, *Circuit Judges*

Appendix G.

ORDER

The petition for panel rehearing of the plaintiff-appellee, Layne-New York Co., Inc. is hereby denied.

By the Court,
JOHN J. GIBBONS
Circuit Judge

Dated: November 22, 1974

Appendix G.

UNITED STATES COURT OF APPEALS
For The Third Circuit

NOS. 73-1930, 73-1931, 73-1932, 73-1933

LAYNE-NEW YORK COMPANY, INC., a corporation of the State of New York

v.

ALLIED ASPHALT COMPANY, INC., a corporation of the Commonwealth of Pennsylvania and COMMONWEALTH OF PENNSYLVANIA, Intervening Defendant

ALLIED ASPHALT COMPANY, INC., Appellant in No. 73-1930

COMMONWEALTH OF PENNSYLVANIA, Intervenor, Appellant in No. 73-1931

LAYNE-NEW YORK COMPANY, INC., a corporation of the State of New York

v.

B. H. MOTT & SONS, INC., a corporation of the State of West Virginia and COMMONWEALTH OF PENNSYLVANIA, Intervening Defendant

B. H. MOTT & SONS, INC., Appellant in No. 73-1932

COMMONWEALTH OF PENNSYLVANIA, Intervenor Appellant in No. 73-1933

Before STALEY, GIBBONS and WEIS, *Circuit Judges*

Appendix G.

ORDER

Motion by appellant Allied Asphalt Co., Inc. and appellant, B. H. Mott & Sons, Inc. for enlargement of time for leave to file petition for rehearing out of time is hereby granted.

The petition for panel rehearing is hereby denied.

By the Court,

JOHN J. GIBBONS
Circuit Judge

Dated: November 22, 1974

APPENDIX H

Sept. 30, 1969 R. H. REINHOLD 3,469,405

MINE WATER BARRIER

Filed Aug. 14, 1968

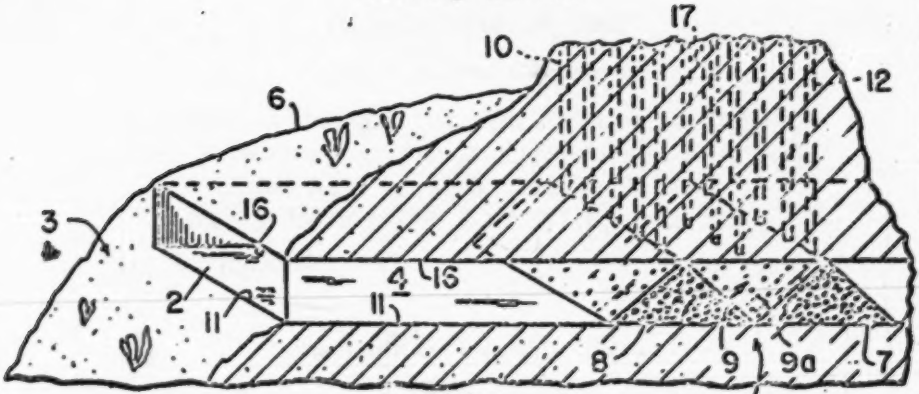
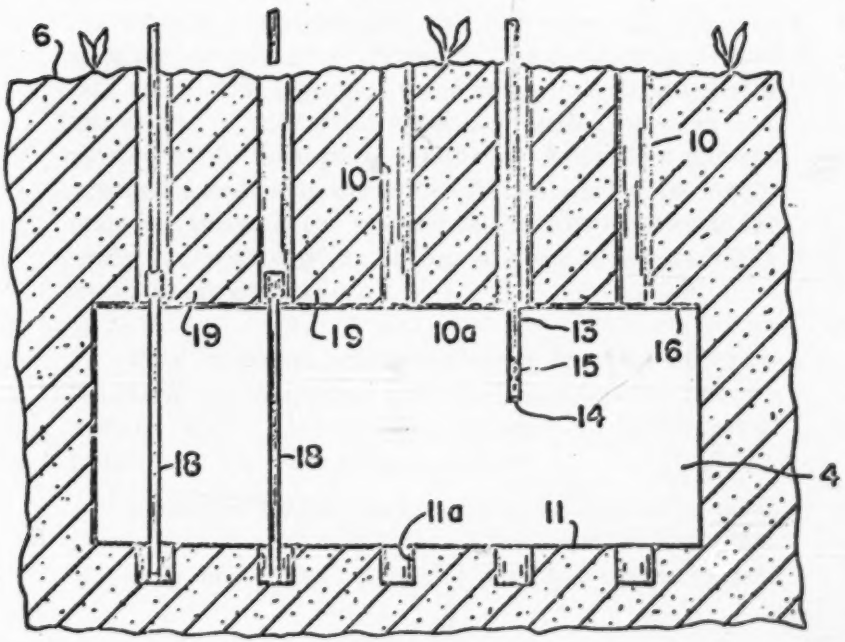


Fig. 1



Appendix H.

UNITED STATES PATENT OFFICE
3,469,405
Patented Sept. 30, 1969

MINE WATER BARRIER

Richard H. Reinhold, Pittsburgh, Pa., assignor to Layne-New York Company, Inc., a corporation of New York

Filed Aug. 14, 1968, Ser. No. 752,683
Int. Cl. E02d *19/12*; E21f *17/16*; E02b *7/02*
U.S. Cl. 61—35
7 Claims

ABSTRACT OF THE DISCLOSURE

A method of constructing a mine water barrier in an underground mine entry by making two substantially parallel rows of borings transversely of the entry, feeding mineral aggregate into the entry through the borings, and grouting the aggregate. The grouted aggregate sets up to form a pair of walls spaced longitudinally in the entry. A number of holes are drilled between and parallel to the borings into the entry. Additional mineral aggregate and/or cementitious fill material is fed under pressure through the holes into the entry between the walls and permitted to set up to form a substantially water impervious barrier.

This invention relates to water barriers and particularly to a method of constructing a barrier for preventing water from flowing through an underground mine entry and onto ground surface.

Abandoned underground mines present large problems to land conservation and reclamation activities. Not only have they interfered with use of the ground

surface above them, due to weakened ground support, but also provide serious health hazards to persons living and/or recreating near them. One critical menace to health is the presence in mines, particularly coal mines, of water which is acid and contaminated, for example by oxidation of pyrites, etc. in the exposed, deserted coal measures. In many coal mines, the mine entry extends a great distance into the side of the coal-bearing hill from the mine entrance. Mining of these hills generally was carried out by opening "rooms" off the entry, and taking coal out of the rooms through the entry to daylight at the mine entrance.

Over the years, surface water has continuously drained into the mines, and taking the path of least resistance, has exited from the mines through the entry, forming pools of stagnant and contaminated water near the mine entrance.

Previous attempts to prevent the formation of such hazardous pools have included building concrete, masonry or cement bulwarks across the entry only at the mine entrance, or cutting back a substantial portion of a hill side to present a large, flat rock face against which a similarly sized concrete dam structure was constructed. Neither method has proved entirely satisfactory, since, in the first case, the mine water has merely passed through the rock adjacent the closed mine entry; and in the second case, ground excavation and dam construction costs, including materials, have been so excessive as to make this method economically unfeasible.

I have invented a new method of constructing a mine water barrier useful for sealing a mine entry to prevent contaminated water from escaping from a mine through the entry. My method also provides for sealing

of rock formations adjacent the mine entry and can be modified to seal rock a substantial distance above the part of the barrier in the entry itself.

Briefly, my invention is a method of building, from ground surface, a barrier in a mine entry usually a substantial distance below the ground. Two support walls are spaced longitudinally from one another across the entry. They are constructed in the following manner. Two spaced rows of borings, each of which boring is usually six inches in diameter, are made in the ground surface above and across the mine entry. The borings may extend through the entry into the rock floor thereof, for instance a distance of about six inches, to provide a solid footing for the barrier, i.e., one which is not founded on gob (waste material left in the entry) or roof cave (material which has fallen from the ceiling of the entry). Mineral aggregate material, such as gravel, is gravity fed through each of these borings into the mine and tamped from surface level to provide a firm, substantially frusto-conical support having its largest diameter on the entry floor and which extends to the entry ceiling. Finally, liquid or flowable grout is forced through a grouting tool lowered into the borings and into each gravel support. When the grout sets up, a pair of substantially water-tight walls are formed. By constructing these support walls in this manner, they have a substantial contact with the ceiling of the entry adjacent the boring while the size of the base of the wall is controlled.

A row of holes is then made from ground surface into the entry. These extend between the support walls and across the entry. Additional mineral aggregate material, either larger or similar to that used to form the sup-

ports for the walls, fly ash, concrete or other cementitious material is gravity fed or blown under pressure through these second or middle holes into the area in the entry between the walls. If material, as gravel, is used, the material is grouted as before. If fly ash or cement is used, it will set up. In either case, upon hardening of the materials used, the combination of the walls and fill in the central area form a substantially water impermeable barrier.

As the grouting tool is withdrawn from the entry through the borings, additional grouting material may be pressure fed at vertically spaced intervals into the rock formation adjacent the borings to seal any rock fissures above the entry. This provides a substantially water-tight barrier above the entry in the rock to withstand a head of water behind the barrier and borings.

An understanding of my invention will result from the following description, and the accompanying drawings wherein:

FIG. 1 is a perspective phantom view taken along a wall of a mine entry of a barrier made in the mine by the method of my invention; and

FIG. 2 is a cross sectional view of a single row of borings extending into a mine entry and showing schematically a suitable grouting tool for use in practicing my invention, and a modification of my invention.

In FIG. 1, I have illustrated a mine entrance 2 which is opened in the slope 3 of a coal-bearing hill. An entry 4 extends a substantial distance from the entrance into the hill. A barrier 5, according to my invention, is positioned far into the entry and at great depth below ground surface 6.

The barrier constructed according to my method comprises a pair of support walls 7, 8 which extend across the entry. The support walls are spaced from one another longitudinally in the entry, leaving an area 9 within the entry.

In constructing my mine water barrier, a first row of borings 10 are made in the ground surface 6 above and across the mine entry 4. The borings are preferably six inches in diameter but may be larger or smaller cross-section. Each boring 10 extends into the entry 4, and may extend into the floor 11 a depth 11a (FIG. 2) of approximately six inches. Where gob or roof cave covers the floor at the point of boring, it is believed necessary that the additional depth be bored to provide a solid footing for my barrier.

A second row of borings 12 are then made across the entry 4 from surface 6 in the same manner as the borings 10. The borings 10, 12 are preferably equally spaced across the entry. For example, for a 10 foot wide by 4 foot high entry, five borings are made in each row; they are spaced from each other on two foot centers.

The rows of borings 10, 12 are made substantially parallel to one another and are spaced from one another. The distance between the rows, and thus the walls, depends upon the head of water to be contained behind the barrier; the greater the pressure of the water, the greater the distance required between the walls.

After the borings 10, 12 have been made, a grouting tool such as a flush joint tube having approximately a 2½" diameter is dropped into a boring. Although there is no specific order in which the borings must be made

or filled, I prefer to use as a starting point, a boring at one end of one of the rows of borings 10, 12 and work therefrom across the mine entry.

A preferred flush joint tube construction is shown in FIG. 2. Briefly, it comprises a casing 13 having a length such that it extends from the bottom of a boring to ground surface and above. An end cap 14 closes the casing at the lower end of the tube and provides a tamping surface. Adjacent the end cap and extending approximately one foot along the length of the casing, there are a number of holes or perforations 15 which surround the tube casing.

A barrier wall is made according to my method by feeding the aggregate or gravel into the entry through the starting boring to form a cone-shaped mound of gravel. The gravel is then compacted by reciprocating the casing 13 of the flush joint tube from above ground to cause the end cap 14 to tamp the apex of the cone. As the gravel mound is compacted by tamping, additional gravel is gravity fed onto the top of the mound and tamped, the feeding and tamping of the gravel continuing until the gravel reaches ceiling 16 of the entry. To cause the gravel to slump and thus form a broad based cone, air, water and/or fly ash may be introduced during the feeding and tamping of the gravel. Preferably, feeding and tamping is stopped when the gravel forms a frusto—conical support between the entry floor and ceiling. The top of the support based upon an entry having a four foot height, extends approximately one foot radially around the boring at the entry ceiling. Several borings may be gravel-filled and tamped simultaneously. The objective is to form a number of supports, each having substantial contact with the ceiling of the entry to form a firm gravel wall across the entire entry.

After the gravel is formed into the firm structure support, the flush joint tube is forced through the gravel to the floor of the entry. Grouting material is pressure fed into the gravel supports. The grouting tool is lifted periodically to spread the grout throughout a support. When all the gravel supports in a row have been grouted, there supports arranged across the mine entry set up to provide a firm wall, as shown at 7 in FIG. 1. A similar procedure of filling the borings is followed to make parallel wall 8.

The area 9 between the two walls in the entry is then filled to complete my barrier. This is done by making or boring from ground surface a number of holes 17 in a row which is substantially parallel to the two rows of borings 10, 12. Preferably, these holes are at least six inches in diameter, although they may be larger or smaller. For a ten foot entry width, I prefer to make three such holes.

The area 9 between the walls is determined by the dimensions of the entry and the spacing and configuration of the walls. Where the entry floor is not solid, i.e., when gob or roof cave are present in the area between the walls, it is preferable that the floor between the walls not be covered by gravel. In FIG. 1, again based upon an entry ten feet by four feet, this is approximately twenty square feet of floor 11.

The walls 7, 8 are allowed to set up or harden providing a solid mass against which to pressure grout the area 9. If not set up, the grout would flow freely through the walls and be wasted. Mineral aggregate or gravel is then gravity fed through holes 17 to substantially fill the area 9. The gravel may be grouted and tamped to make a firm fill structure 9a. The structure 9a may be made

using the same size gravel as that used in making the two walls 7, 8 or may be made of larger or smaller gravel. It is important to the stability and integrity of the barrier that the fill 9a used in the area 9 be as homogeneous a mass as possible, and that the fill mixture be compatible with the materials forming the walls of my barrier.

A cement may also be used in the area 9. It should have, preferably a 500 pound concrete compressive strength (p.s.i.) to provide a strong, water tight barrier when it sets up. It is particularly desirable to use cement in the area 9 if gob is present.

A barrier support having great strength against water pressure is achieved, as shown in FIG. 2, by inserting a tube 18 into a cone of gravel before grouting the gravel to form the barrier walls 7 and 8. This tube, preferably, is ordinary pipe having a 1½″ nominal diameter. The pipe is lowered into a hole 10 on the end of a length of connected pipe and is joined to the lower end thereof by a separable connection, such as a left hand-right hand coupling. When the pipe is completely in the hole, this connection is slightly above the ceiling of the entry. After the pipe is completely lowered into the entry, additional gravel is fed around it and grouted. When the grout sets up, the pipe 18 is embedded in the fill 9*a* providing additional stability. The upper pipe lengths are then backed out of the hole separating them from the embedded pipe 18 at the coupling. A pipe 18 may be used in any or all of the borings 10, 12 and 17 in the same manner.

Many types of grouting are suitable for use in my barrier construction. I prefer to use a flowable grout comprising 3 parts fly ash and one part portland cement,

commonly known as Type II portland. To promote setting up of the grout, a silica gel additive can also be used, or a caustic solution or accelerator. Various commercial grouts are satisfactory including those grouts derived from a gel base, a reactant and accelerator, or a silicate, an amide, chloride, aluminate, bicarbonate and cement.

In a further modification of my invention, we apply grouting principles to the rock above the entry immediately adjacent the barrier in the entry. In any one or all of the borings 10, 12 and holes 17, grout is placed under pressure through the borings and into the rock voids and fissures in the area 19 above the entry. By grouting the rock areas above the main barrier in the entry, from each boring, it is practicable to make a pair of substantially water tight dams above the barrier. Then grout is pumped through the holes against the dams under pressure to seal the rock area above the barrier. Such a construction enables great heads of water to be retained in the mine behind the barrier. Destruction of open areas, such as lakes, ponds and streams by contaminated water is thus prevented.

My barrier is economical to construct since earth moving costs are avoided and drilling methods are used. The bulk materials used, such as gravel, fly ash, sand and cement and the like are relatively inexpensive to purchase and apply.

Although I have described a preferred embodiment of my invention, it is understood that it may be otherwise embodied within the scope of the appended claims.

I claim:

Appendix H.

1. A method of constructing from ground level a barrier for preventing water from escaping an underground entry comprising:

(1) making a first row of borings from ground level into the entry and laterally across the entry;

(2) making a second row of borings from ground level into the entry and laterally across the entry, the rows being spaced from one another longitudinally in the entry;

(3) feeding and tamping sufficient mineral aggregate into each of the borings to close the entry and grouting said aggregate to form a pair of spaced support walls;

(4) drilling holes between the support walls; and

(5) filling the space between the support walls with cementitious aggregate whereby the aggregate fill and the walls will set up to form a substantially impervious water barrier in the entry.

2. The method set forth in claim 1 wherein at least one of the borings and the holes are drilled substantially simultaneously.

3. A method as set forth in claim 1 in which the walls in the entry are permitted to substantially set up before filling aggregate into the entry between the walls.

4. The method set forth in claim 1 including drilling the borings to extend through the entry and into the entry floor.

5. The method set forth in claim 1 including inserting a pipe length into one of the borings and holes through the mineral aggregate to provide additional strength to the barrier.

6. The method as set forth in claim 1 and including the area between the borings and holes over the entry and below ground level above the barrier.

7. A method of building a support wall in an underground entry against which cementitious aggregate can be pressure cast comprising the steps of:

(1) making a row of borings from ground level laterally across the entry;

(2) alternately passing loose mineral aggregate into the entry through the borings and performing a step for causing the aggregate to extend across the entry and to have substantial contact with the ceiling of the entry; and

(3) filling the interstices of the aggregate with a cementitious grouting material, whereby the support wall formed will be substantially impervious to water.

Appendix H.

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